

## Claims

- [c1] 1.A double confocal scanning microscope comprising:
- a light source defining an illuminating beam path
  - a detector defining a detection beam path, and
  - at least one optical component acting on the illuminating and/or detection beam path, wherein the optical component is configured that it influences the amplitude, phase or polarization of the light; and the characteristics the light in the illuminating beam path or the detection beam path of the double confocal scanning microscope are thereby modifiable.
- [c2] 2.The scanning microscope as defined in Claim 1, wherein the optical component is used to modify the shape point spread function (PSF) in the illuminating beam path and modifying the point spread function (PSF) in the detection beam path of the double confocal scanning microscope.
- [c3] 3.The scanning microscope as defined in Claim 2, wherein the point spread function (PSF) in the illumination beam path and the detection beam path shows axially arranged secondary maxima both of which are modifiable as to their shape and/or position.
- [c4] 4.The scanning microscope as defined in Claim 3, wherein the optical component is used to increase the distance between a principal maximum of the point spread function (PSF) in the illumination beam path and a principal maximum of the point spread function (PSF) in the detection beam and secondary maxima.
- [c5] 5.The scanning microscope as defined in Claim 3, wherein the optical component is used to diminish the intensity of the secondary maxima of the point spread function (PSF) in the illuminating beam path and the point spread function (PSF) in the detection beam path.
- [c6] 6.The scanning microscope as defined in Claim 3, wherein the optical component is used to locate the secondary maxima of the point spread function (PSF) in the illuminating beam path and the point spread function (PSF) in the detection beam path at different, preferably axial, positions.

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| [c7]  | 7.The scanning microscope as defined in Claim 1, wherein the optical component provided in the illuminating beam path is different from that provided in the detection beam path.                   |
| [c8]  | 8.The scanning microscope as defined in Claim 1, wherein the optical component modulates the wave front of the illuminating light and/or detection light.   |
| [c9]  | 9.The scanning microscope as defined in Claims 1, wherein the optical component is arranged in a microscope objective pupil or in a plane optically conjugated therewith.                           |
| [c10] | 10.The scanning microscope as defined in Claim 1, wherein the optical component is arranged at any desired location in the illuminating beam path and/or detection beam path.                       |
| [c11] | 11.The scanning microscope as defined in Claim 1, wherein the optical component is an amplitude filter and/or phase filter.   |
| [c12] | 12.The scanning microscope as defined in Claim 1, wherein the optical component is a retardation plate and/or phase plate.  |
| [c13] | 13.The scanning microscope as defined in Claim 1, wherein the optical component is an LCD (liquid crystal device) arrangement.  |
| [c14] | 14.The scanning microscope as defined in Claim 1, wherein the optical component is configured as partially amplitude-modifying elements.  |
| [c15] | 15.The scanning microscope as defined in Claim 1, wherein the optical component is configured as an adaptive optical system, preferably in the form of a deformable mirror.                         |
| [c16] | 16.The scanning microscope as defined in Claim 1, wherein the optical component is embodied as a dichroic filter that preferably is arranged in the illuminating beam path and detection beam path. |